The Excavating Engineer

Vol. 18 JULY 1924 No. 7

Here's a Highway Job That Isn't All Roses

Description of Brown & Floyd's 156,600 Cubic Yard Contract with the West Virginia State Highway Commission

IT isn't often that we have occasion to publish a road article dealing with railroad-type shovels and dump cars. Through long years of habit, we have come to associate that time-honored combination with a railroad job, the formidable wall of a quarry face, or the systematic layout of a mine bench system. However, as years go by, we note with growing frequency how operators are looking with greater respect on the ability of the small revolving shovel to "stand the gaff" of heavy rock work.

This installation, however, a highway job near Charleston, West Virginia, is a little out of the ordinary, in that we find thereon an example of

The Bucyrus 70-C Loading into Dump Cars

severe digging conditions handled by both the conventional railroad-type shovel and dump car combination and the lighter, more mobile small revolving shovel equipment, moreover, both demonstrating their respective abilities to cope with their tasks.

The work to which we refer, and that which is illustrated in these views, was awarded to Brown & Floyd, contractors of Charleston, West Virginia, by the West Virginia State Highway Commission on May 3, 1923, and consists of ten miles of new road between Little Sandy Creek and Clendennin in Kanawha County along the Valley of the Elk River, south of Charleston. The contract was awarded at an approximate total cost of $184,790.50, the bid price being 75c a cubic yard. The entire excavation amounts to 156,000 cubic yards with 26-foot width of road. Up to the time we go to press, there has been no contract let on the paving.

This stretch of road will be part of one of the north and south roads through the state, and leaving Charleston follows the Elk River for a good many miles. In following the valley of the Elk River, steep precipitous cliffs are being encountered, and for a distance of a mile and a half, where a branch of the New York Central Railroad comes in it is necessary to blast out the cliffs in order to get a highway next to the railroad tracks.

The Excavation

The entire excavation is being handled by three shovels, a 70-C, a 20-B and a 14-B, all of which are Bucyrus, the former being a railroad-type shovel on standard railroad trucks, and the other two of the small revolving ¾-yard type. The material consists for the most part of shale and earth, but over a stretch of a mile and a half there is solid rock, which requires blasting ahead of the shovel. The drilling is being done by Ingersoll-Rand Jackhamers operated by compressed air.

On the most of the work the material was loaded into ½-yard Watson wagons and used for fill over a maximum haul of 1000 feet. On a part of the work, however, 12-yard Western dump cars were used. On the last four miles of the work, 75% of the material was cast over the railroad track right-of-way into the river. The cutting is greatly varied, some of the cuts having a depth of 40 feet at the ditch line.

The excavation on the whole has been particularly difficult for various reasons. The solid rock which required blasting would ordinarily be

difficult enough to handle were it only to be loaded into dump cars and hauled to the fill. When this alone was done, work was not delayed, but one of the chief difficulties arose when the blasted material fell down on to the tracks from the cliffs overhanging the railroad right-of-way. After such blasts as these, it was necessary to

The 70-C shut down waiting for the Bucyrus 20-B to move the house, shown in the view, in order to make room for a dumping area. The house was jacked up and a cable put around it, then the 20-B hauled it away without any effort.

do considerable cleaning up, and the Bucyrus 20-B ¾-yard shovel was used for the work.

On other portions of the work, the blasted material was not used for fill, but was overcast by the 70-C railroad-type shovel and recast over into the river by the 20-B.

It is expected that the work will be finished about July 31 of this year.

Brown & Floyd are well-known Eastern contractors with a number of successful contracts to their credit. The partnership consists of G. S. Brown and G. J. Floyd. The superintendent on this job is Herman Boyer, and the foreman is Ed. Boyer. D. D. Harris is operator of the 14-B, Ed. Eddington is on the 20-B, while Tom Eskew is handling the 70-C.

William Hammerschmidt

The many friends of William Hammerschmidt, President of the Elmhurst-Chicago Stone Company of Chicago, were shocked to hear of his death on May 30th at his home in Lombard, Illinois.

Mr. Hammerschmidt was born in Naperville, Illinois, October 10, 1854. He was supervisor of York Township for thirty-two years, president of the Lombard, Illinois, School Board for twenty-four years, and president of the Board of Trustees of St. Peter's Evangelical Church in Elmhurst for the last thirty-eight years. Mr. Hammerschmidt was also president of the Lombard State Bank and a director in other banks, stone quarries and other enterprises in Du Page County, Illinois. He leaves a widow, six children and thirteen grandchildren.

A Train of 12-yard Western Dump Cars Being Loaded by the Bucyrus 70-C. The Material is Used for Fill.

Quarrying Building Stone in Ontario

Description of the Plant of the Oliver Rogers Stone Company of Owen Sound, Ontario

IF one should happen to pass through one of the railroad freight yards in Toronto, or in fact any other progressive Ontario town, his attention would be immediately attracted by a number of cars here and there loaded with grey flat building stone of almost even size, as if rough sawn from the solid rock. It is just the kind of material to catch the eye of the architect, for the stone is the kind that would lend an effect of artistic solidity, which home-builders appreciate.

If he should follow this stone to its ultimate destination, he would find it being built into unusually attractive dwellings in the most desirable sections of the city. The stone to which we have referred is the product of the Oliver-Rogers Stone Company, of Owen Sound, a city of some twelve thousand, in the district of Grey, Ontario.

This plant at Owen Sound is well situated with reference to both railroad and great lakes shipping, having easy access to Lake Huron through Georgian Bay, and is well equipped with an elaborate layout of quarry equipment, their output of building stone being only a portion of the company's business.

The crushed stone output of the quarry is a most important factor. The main quarry operations are carried out by a Bucyrus 70-Ton railroad-type shovel, a Sanderson-Cyclone Drill and a Thew small revolving shovel, which is used for clearing up the debris.

Steam Trucks Used

The photographs which accompany this article show in a measure the method of getting the quarried stone to the scalping screen. The quarry floor is exceptionally level, as the rock is stratified in even horizontal layers from 6 to 9 inches in thickness.

Two views of the plant of the Oliver-Rogers Stone Company at Owen Sound, Ontario. The upper view shows the incline track to the grizzly screen and crushing plant. The large stone is rejected directly into standard gauge railroad cars for building purposes, while the smaller size is crushed for road aggregate.

The lower view is a more general one of the plant, showing the two standard gauge tracks so arranged that two cars may be loaded at one time.

Over this smooth floor, two 5-ton steam trucks of English design haul the rock with easy rapidity from the shovel to the dump. Each truck is fitted with side dump bodies, improvised from standard dump cars, and dump their load into a hopper on the floor level, from which the material is hoisted up to the grizzly in a car operating on an incline track.

65-Ton Bucyrus Shovel Loading Stone into an English Steam Truck Equipped with an Old Western Dump Car Body, which Carries Stone to Incline Track

The Grizzly

The grizzly or bar screen is provided with openings to reject only the large stone, suitable for building operations, which is loaded directly into cars ready for shipment.

The small-sized stone passes through the bars and feeds by gravity into a gyratory crusher. From the crusher, the material passes by a bucket

This shovel, No. 508, owned by the Oliver-Rogers Stone Company, Owen Sound, Ontario, was originally sold to Johnson Bros., Brantford, Ontario, in 1903. Steam trucks are seen in the foreground. A Sanderson-Cyclone Drill may be seen in the background.

elevator to screens over large storage bins, where several sizes of crushed stone is stored ready for shipment.

Two standard gauge tracks pass under these bins, so arranged that two cars may be loaded at the same time. A runway is also provided, which passes under the bin at its outer end, where any size of stone may be loaded into trucks or wagons.

The rejections from the screen go back to a reduction crusher in the usual manner.

Another View of the 65-C

The plant is under the direction of S. J. Oliver, the president of the company, under whose expert supervision the Oliver-Rogers Stone Company has made a name for itself.

Tying the Sack Before It Is Filled

Filling a cement sack upside down after the top has been tied sounds like a curious business. But let's see about it.

Less than twenty years ago, the filling of cloth sacks with portland cement was a slow, back-breaking operation. Cement was stored in bins and workmen filled the sacks with a shovel. As every sack had to contain exactly 94 pounds, it was necessary to stop and weigh each package and regulate the amount by adding a little cement or taking a little out.

All sacks had to be tied, lifted and carried by hand. A crew of four men working at full speed could seldom fill more than 1,600 sacks a day.

Then the pressure for output, especially in the rush season — summer — when labor for packing and loading is hardest to get, brought a change.

Cement today is still stored in bins, but the filling is done by machines and these machines have brought with them the sack that is tied before it is filled—the sack with a hole and a valve in the bottom. From the bottom of storage bins the cement is moved by screw and belt conveyors to a hopper over the filling machine. From this hopper, aided by an elaborate mechanism, including a fan, it flows like water out of a 1-inch tube into the sack. When the sack has been filled to the weight of exactly 94 pounds, it tips a scale which stops the cement, and drops to a moving belt which carries the sack out to the freight car. By this method, a crew of four men can fill and load 8,000 sacks in a day.

It was in 1907 that the first valve sack was used in cement shipping. The valve consists of a flap over the hole in the bottom of the sack, and is made by turning over a corner of the cloth before it is sewed. When the sack is filled, the valve closes and is held shut by the weight of the contents.

Although the idea of a valve is extremely simple, the production of a filling machine was a different matter. The first machines were unsuccessful and it was only after a number of years' experimenting that the present-day efficient equipment was produced.

With the advance in methods of packing has come also the use of wire instead of binding twine for tying the sacks. About 40,000 miles of wire was used for this purpose last year, when approximately 400,000,000 sacks of cement were filled by valve machines.

Harnessing the Androscoggin for More Power

How the Sanders Engineering Company Did the Excavation for the Twin State Gas & Electric Company's Two-Unit Addition to Their Power Plant at Gorham, New Hampshire

ALMOST within the shadow of Mt. Washington, which towers 6293 feet above that beautiful region of the White Mountains in Northeastern New Hampshire, lies the town of Gorham, on the Androscoggin River.

Here the Sanders Engineering Company, Contractors, of Portland, Maine, have recently completed the construction of a two-unit addition to the hydro-electric power plant of the Twin State Gas & Electric Company whose general offices are in Boston, Massachusetts.

The reason for the work lay in the demand for increased power from the old power plant, which formerly produced about 2000 horse power and served the surrounding towns of Gorham, Berlin and others with power and light. It was decided some time ago that a two-unit addition would be advisable, which required the construction of a new tail race canal, 1100 feet long and 80 feet wide at the bottom.

The contract for the entire work, which included both the construction of the plant addition and the new tail race, was awarded to the Sanders Engineering Company, 102 Exchange Street, Portland, Maine, and work was started on June 1, 1923. The completed work, including new electrical equipment, cost about $275,000. I. W. Jones & Co., Milton, New Hampshire, were the consulting engineers, and R. J. Andrus was the engineer for the company.

The Excavation for the Plant Addition

The construction of the new station, involving approximately 10,000 cubic yards of excavation, was handled by a Bucyrus 20-B extra high-lift steam shovel equipped with a ¾-yard dipper. The material consisted of a heavy glacial drift of boulders imbedded in coarse gravel, as may be seen in the accompanying photographs. Anyone who is familiar with New England will readily appreciate that the excavation of this material is no mean job for a shovel of considerably greater rated power than this little ¾-yard machine. However, the work was handled with entire satisfaction to all concerned.

The cut was about 20 feet deep, and the material was loaded into 1½-cubic-yard steel scale pans hoisted from the shovel, and dumped on the bank by means of two derricks. It is interesting to know that during the construction one-half of the old plant was kept in operation.

Tough going for a ¾-yard shovel. The material consisted of a heavy glacial drift of boulders imbedded in coarse gravel. The Bucyrus 20-B loaded the material into scale pans, which were hoisted out by means of two derricks.

View of the construction of the two-unit addition to the hydro-electric power plant, showing the Bucyrus 20-B ¾-yard shovel in operation. The view was taken from the power house looking down the river. The cofferdam is seen at the left.

The Canal Excavation

The canal which was built for the purpose of supplying additional power to the new section of the plant, was 1100 feet in length, and followed in a general way the course of the Androscoggin River. The construction of a cofferdam was necessary to hold back the waters of the river and provided almost dry excavation. The material handled consisted of the same class of material

View from about the center of the canal looking up the river, with the new power house in the background and in the left foreground the Bucyrus 20-B.

that was encountered in the excavation for the power plant.

The depth of the cut varied from 5 to 12 feet. The width of the bottom was about 80 feet with side slopes of two horizontal to one vertical and about 15 feet below the level of the water on the other side of the coffer. The work on the canal was also done by the Bucyrus 20-B high-lift shovel after it had completed the excavation for the new plant addition. The shovel loaded into 1½-cubic-yard scale pans which were over-handled by a specially made crane derrick on wheels, equipped with a 70-foot boom.

The work was done in single shifts of ten hours, with a daily output of approximately 300 cubic yards, which in view of the difficulty of the excavation and the class of material encountered

Excavating for the foundation. The material was loaded from here into 1½-cubic-yard steel scale pans, hoisted from the shovel and dumped on the bank by means of two derricks.

is considered excellent. The entire job was completed in January of this year.

We are indebted to E. E. Sanders, President of Sanders Engineering Company, for the photographs accompanying this article.

Digging Sand and Gravel from the South Platte River in Colorado

Description of the Sand and Gravel Operations of the High-Grade Sand and Gravel Company of Denver, Colorado

DOWN in Colorado, eight miles south of Denver on the Denver and Rio Grande Western Railroad, at a point known as Military Junction, the High-Grade Sand and Gravel Company is making things hum to an output of 800 yards of sand and gravel a day.

Over a tract of 55 acres this company has in store for them an estimated amount of 2½ million cubic yards, with a million yards already in sight. Over 20 acres of this tract there is no overburden to handle, while the remaining 35 acres carry a stratum of between two and three feet of sandy loam which will have to be stripped. Engineers sounding the depth of the deposit have gone to a point 35 feet below the surface, and believe that a depth of 50 feet may be productive of high-grade gravel. The gravel has a constituency of quartz and granite, 5% of which is oversized and must be sent to the crushing plant.

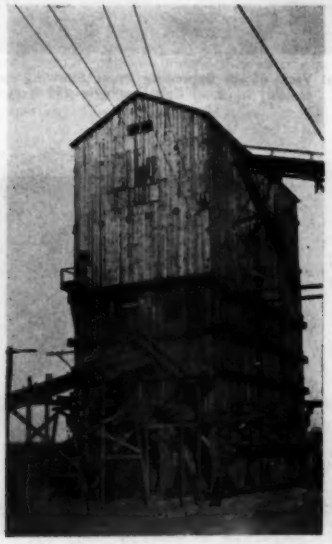
Method of Excavation

The material is pumped from the river bottom of the headwaters of the South Platte River by a 12-inch American manganese pump driven by a 300 h. p. motor through a plain end suction nozzle which takes the material over a dredge line into two sumps. The line will not exceed 1000 feet in length throughout the operations. At present it is only 400 feet long.

The material is then taken from the sumps and dumped directly into a hopper over a belt conveyor leading to the screening plant. This handling from the sumps to the conveyor is being done by a Bucyrus 50-B clamshell excavator equipped with a 45-foot boom and a Williams 1½-cubic-yard bucket. When this machine was first purchased by the High-Grade Sand & Gravel Company, it was immediately engaged to excavate for the sumps. This was in the early spring, and rain and snows were instrumental in delaying the work to no little degree. When that work was completed, however, the clamshell excavator began its present work of loading the sand and gravel brought up from the river's bottom by the suction dredge directly on to the belt conveyor. It is now loading gravel at the rate of 800 cubic yards per eight-hour day.

View of the Bucyrus 50-B Clamshell Excavator, with the Washing Plant in the Background

The Bucyrus 50-B Clamshell Excavator Loading Material from the Sump on to the Conveyor

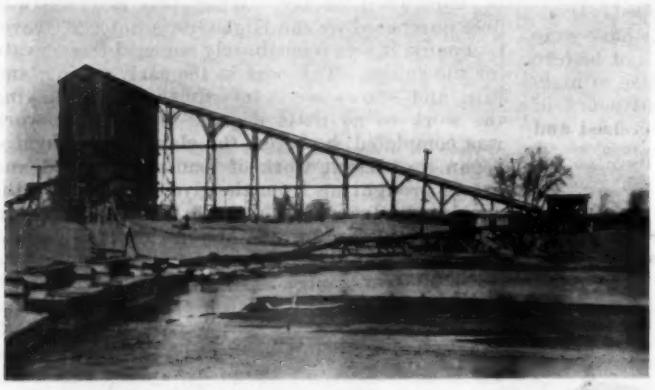


View of the Washing and Screening Plant

Views of the High-Grade Sand and Gravel Company's Operations Near Denver, Colorado

The suction dredge, equipped with a 12-inch centrifugal pump, driven by a 300 horse power motor. This takes the material from the river bottom and sends it over a pipe line to the sumps.

The 50-B Clamshell Excavator in Operation, Showing the Pipe Line in the Foreground



General View of the Screening Plant Showing the Incline which Supports a 30-inch Belt Conveyor 250 Feet in Length

Another View of the Bucyrus 50-B Clamshell Excavator

The Incline Showing the 30-inch Belt Conveyor Which Takes the Material from the Sumps to the Screening and Washing Plant

View of the Washing and Screening Plant Showing the Denver & Rio Grande Western Tracks

Views of the High-Grade Sand and Gravel Company's Operations at Military Junction, Near Denver, Colorado

The Screening Plant

The conveyor which leads from the sump to the screening plant is a 30-inch belt conveyor 250 feet in length and is operated on an 18 degree angle. After the material is loaded by the clam-shell excavator on the conveyor it is carried to the screening plant. Here there are two 24-foot by 48-inch revolving and two Trommel screens, which are designed to produce sizes of 2½ to 1¼, 1¼ to ¾, ¾ to ¼, ¼ to No. 6 mesh, and No. 6 mesh and smaller.

The material is washed by Stephens-Adamson sand settling tanks using 1250 gallons a minute.

The storage bins which are provided for all sizes have a capacity of 300 cubic yards each or a total capacity of 1500 cubic yards.

The Power Plant

The plant is electrically operated, power being obtained from Arapehoe Light & Power Co. The pump on the suction dredge is operated by a 300 h. p., 2300-volt motor, while a 15 h. p. motor is maintained for the priming pump in addition to a 15 h. p. motor for the hoist in operating the nozzle. A 60 h. p. motor operates the screens and belt conveyor. All of the motors are 2300 volt.

The High-Grade Sand and Gravel Company have their main offices in the Tramway Building in Denver and are well known throughout the State of Colorado. The sand and gravel and crushed rock which they produce has a good quality for commercial purposes, and continued success of the company is assured.

G. W. Hamilton is the president of the Company, A. B. Apperson is vice-president and C. B. Berry is secretary and treasurer. George S. Gardner is the superintendent of their operations.

Know Your Truck Costs — I

By P. L. Sniffin

An excavating engineer who operates any number of motor trucks should know what the operation of these vehicles costs, and how this cost is distributed among the different items of operation. He should also know the relation of these costs to the work accomplished. If truck costs are not watched, they will grow into large sums which have not been taken into account as an expense of doing business, and which will only appear as a reason for a smaller showing of profit at the end of the year.

The first step in cost keeping is to establish an objective to be met by means of the daily records and their subsequent summaries. The following table, used by one concern, seems to fill the requirements adequately. By way of explanation, it will be noticed that this table is to be filled out once for each vehicle, and that each line calls for a figure to be inserted from records previously obtained. The table computes itself as it goes along, leading finally to the figure which represents the cost per ton-mile.

OPERATION RECORDS

For the Period.....to.....Truck No.....
Period covered by this summary.....
Days of actual use.....
Days out for repairs.....
Total number of round trips.....
Loads hauled (in tons).....
Total miles traveled.....
Gasoline — total gallons used.....
Oil — total gallons used.....

Daily Averages (Based on Days Operated)

Round trips per day.....
Loads per day (in tons).....
Miles traveled per day.....
Number ton-miles per day.....
Average miles traveled per round trip.....
Average tons per round trip.....
Miles per gallon of gas.....
Miles per pint of oil.....

COST RECORDS

Investments

Cost of chassis.....
Cost of body.....
Cost of cab.....
Cost of special equipment.....
Total investment.....
Value of tires.....
Investment less tires (to be depreciated separately).....

Variable Charges — Total for Period

Total cost of gasoline.....
Total cost of oil.....
Cost of tires
(pro-rated for period according to mileage).....
Cost of depreciation of investment
(see explanation below).....
Total cost of maintenance and repairs, painting, etc.
(pro-rated, actual or estimated).....
Total of variable charges.....
Wages of driver and helper.....
(Note: Some concerns figure this as a separate item not included here)
Total fixed charges (computed later in table).....
Total operation cost for period.....

Fixed Charges — Yearly

Interest on investment.....
(One-half of current rate on total investment above. See explanation below.)
Taxes and licenses.....
Insurance .....
Garage expense.....
Total of above fixed charges per year.....
Total per day.....
Total for period (this is item to be inserted above as "Total Fixed Charges").....

Daily Costs — Summaries

Cost per day operated.....
Cost per mile traveled.....
Cost per ton — hauled.....
Cost per ton-mile.....

The above form is simple enough when carefully studied and worked out point for point. Only one or two items will need explanation. The total investment of the equipment is figured minus the tires for the purpose of arriving at the depreciation. The investment is best depreciated on the basis of the number of miles traveled in the period, that is, pro-rated according to the estimated life of the vehicle. Tires are depreciated

(Continued on Page 267)

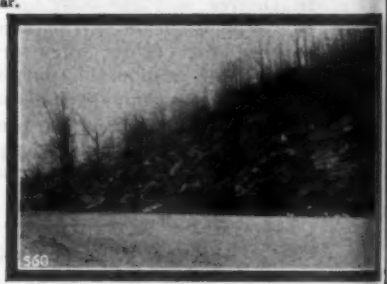
Typical Work Under Way by Well-kno Co

Another small revolving shovel in New York, which is making things hum on the job, is that of Joseph Deseasa's Bucyrus 20-B which is shown above in operation in a cellar at 168th and Grand Concourse. C. W. Capazzi is the operator, while M. Capazzi is making the smoke for him. In the lower view, Mr. Deseasa is seen at left, with his blast foreman.

The above views should be of interest to the excavating contractor. At the left is shown the Bucyrus 20-B shovel of Wm. A. Ferguson in operation on a 12,000-yard job of excavating for the basement of the new Alexander Hamilton Hotel at Paterson, New Jersey. On the day that this picture was taken they had sent out 129 four-yard loads in nine hours, an output which would have been greater with a more ample supply of trucks. Tom Ferguson and Tom Ferguson, Jr., are the crew on this shovel.

The center view shows Thomas Hand's Bucyrus 20-B in tra this shovel and the services of Mr. Hand, who is a very capa side Avenue, where the Grand Construction Co. have a contr 12-foot cellar.

The above three views show Charles D. Beckwith's two Bucyrus 20-B shovels in operation on Riverside Drive. C. D. Beckwith is one of New York's best-known contractors. One of his recent jobs which attracted favorable attention was that of repaving 5th Avenue between 42nd and 59th Streets.



A description of the above work is hardly necess to give against. The shovel is a Bucyrus 30-B and is owne by Mic of the Bronx, having been purchased particularly for this w rock on the Riverside Drive extension in the neighborhood o of the one man in the city he knew to be capable handl runner who has operated all makes of shovels for the past politan territory. Michael O'Rourke, son of the well-known

Contractors In and Around New York

Above is a view of a cellar job being handled by Handy Bros., well-known contractors of the Bronx. The work is at 145th Street and Riverside Drive. Handy Brothers were responsible for an excellent bit of excavation in connection with the construction of the Hell Gate Power Plant of the New York Edison Co. where they handled 150,000 yards of rock in seven months with no repairs and only a reasonable cost for replacement of wearing parts.

Another job which is attracting some attention as a heavy piece of rock work is that of James E. Gaffney's on the Riverside Drive extension. The machine above is a Bucyrus 20-B ¾-yard shovel, and it may be readily seen from the views that the excavation is heavy.

The above views show the two Bucyrus 20-B shovels owned by George M. Brewster & Son's, Tenafly, New Jersey, in operation on road work in East Paterson, New Jersey. The machine on traction wheels was the first of the two purchased. At the time these photographs were taken, they were just finishing a nine-hour day and had completed a cut of 490 feet long by 11 feet wide, having excavated 3 inches of Amesite and 7 inches of rock and soil, leaving an excellent grade. Mr. Geo. L. Rehill, inspector on the job, who had been inspecting work of this kind for the past 30 years, stated that it was the best and most rapidly executed piece of grading he had ever seen. Mr. Jack Ryan, superintendent on the job, said that they have done a mile of this work with a full width of 22 feet and a cut 10½ inches deep in one week with their new Bucyrus 20-B on caterpillars and their old one on traction wheels, which is a year and a half old. P. F. Devitt is operating the machine on caterpillars, while James McGaffrey is the fireman. Charles Long is the operator of the other 20-B and Dick Hill is firing. Even though the latter shovel is working on pontoons it is making a record for small revolving shovels.

a new job. Mr. Cavalluzzo, contractor of Brooklyn, is renting erator. The view below was taken at 17th Street and Wood- basement excavation. The machine is shown loading out of a

give the reader an idea of what this shovel is up Michael Del Balso, one of the leading contractors this work. The work consists of 65,000 yards of of Dyckman Street. He procured the services handling this work, John Bernardo, a well-known past 28 years throughout the New York Metro- own rock man, is firing.

The Excavating Engineer

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THE EXCAVATING ENGINEER PUBLISHING CO.

Bradlee Van Brunt, Manager and Editor

South Milwaukee, Wisconsin

Printed in the U. S. A.

What Is Horse Power?

There is a well-known series of newspaper comics entitled "But does it mean anything?". We should like to see the artist add to his cartoons the picture of a contractor, surrounded by salesmen of various concerns which market gasoline-driven excavators. The salesmen would all be pointing to specifications and blue-prints, and arguing horse power, and the bewildered contractor would be saying, "It's all very pretty, but does it mean anything?".

Of course, every school boy knows that one horse power is the ability to raise 33,000 pounds through a height of one foot in one minute. This horse power really does mean something quite definite. But *rated* horse power means almost anything that the manufacturer wants it to mean. It's all a question of how he measures it.

So when salesmen and sales catalogs compare gasoline engines on the basis of horse power as rated by the manufacturers, it behooves the purchaser to pull out his own tape measure and make his own comparison. He cannot know whether one company has rated its product on the basis of the very highest horse power developed on the test block, and perhaps a speed which would never be duplicated in service; or whether another company has been very conservative and has rated its product merely at the horse power developed in the field under average, or even severe, conditions; or whether another company has used some formula to obtain its rating. To compare horse powers, on the basis of manufacturers' ratings, means nothing.

Yet a prospective purchaser usually wants to compare horse power. How is he going to do it? We suggest that he use some simple formula, which involves certain easily ascertained dimensions of the engines submitted to him.

Such a formula is the following for four-cycle gasoline engines: Multiply the cylinder diameter (in inches) by itself; then multiply by the number of cylinders; then multiply by the length of piston stroke (in inches); then multiply by the number of revolutions per minute; then divide by 15,000. The result is the horse power. Regardless of how this result may vary from the true horse power, you can be sure of one thing; namely, that having measured all the machines by the same method, you have figures which will give an absolutely fair comparison.

The more conservative manufacturers no longer give a horse power rating but rather merely list the cylinder diameter, stroke, R. P. M., etc.

Horse power is, of course, only one of many points to consider. For example, high-speed engines, regardless of the horse power, are unfitted for intermittent work such as that of excavating. An engine with a heavy flywheel will carry through a peak load better than one with a lighter flywheel, although the latter may be of slightly greater horse power, and so forth.

But whatever reliance is placed on horse power, comparisons should certainly be based on ratings computed on a uniform basis.

L. A. Desy

Many of our readers will learn with much regret of the death of Mr. Louis Arsene Desy, M.R.I.C., a prominent Canadian engineer, who was buried in Montreal on May 5th. Full details of his death was received by us too late for publication in our June number. Mr. Desy died after a short illness of three weeks.

Mr. Desy was born in St. Cuthbert, Quebec, on the 8th of March, 1856, and was educated in Montreal. The early part of his life was devoted to architecture. During the period between 1880 and 1885 he was appointed by the late Sir William Van Horne, then the President of the Canadian Pacific Railway, to design all the stations on that line from Winnipeg to Vancouver.

From 1885 to 1887 he continued his profession in Duluth, Minneapolis and St. Paul. He then returned to Montreal, and after a short time his passion for mechanical work overcame his architectural tendencies and he devoted considerable time to inventing various machines, particularly excavating machinery.

From 1894 until 1901 he was mechanical superintendent of the Montreal Harbour Commissioners, in charge of the dredging and wharf improvements. During this period, while he was with the Harbour Commissioners, he developed some new ideas in connection with their work, such as the use of steel castings in construction of dipper buckets, and used steel castings for the lip, the bottom and the door. For the clamshell buckets, the sides and the lips were made of steel castings. The other invention was known as the backing rig, which was an automatic device for pulling back the dipper arm and taking the place of the common backing chains which were used on most dipper dredges.

From 1901 to 1904 he was superintendent of the dredging of the St. Lawrence Channel and Lake St. Peter.

From 1905 to 1910 he acted as superintendent for the dredging plant of the Maharajah of Jammu and Kashmir

of Kashmir, India, and supervised the erection of a fleet of Bucyrus dredges all electrically operated, consisting of one dipper dredge, two suction dredges and two clamshell derricks. In addition he supervised the construction of substations, scows, tugs, a machine shop and a sawmill.

From 1910 to 1911 he was in the employ of the Bucyrus Company as an engineer in the operation of dredges on the New York State Barge Canal.

The next three years he spent considerable time developing a caterpillar-mounted clamshell or orange-peel excavator.

In the early part of the war up to 1916 he was engaged in carrying out shell contracts on his own account, and from then on to the close of the war acted as chief engineer for Limburners, Ltd., on shell contracts.

He closed his career as he started, as an architect, designing and building apartment houses in Montreal.

Arizona Rejoices

The news of the passage by Congress on June 3d of the long-hoped-for San Carlos bill has brought joy to every citizen of Arizona.

The San Carlos bill will make $5,500,000 available for the construction of a dam on the Gila River near San Carlos, Arizona. It will provide water for the irrigation of 80,000 acres, the larger portion of which is in the Pima Indian Reservation. The measure provides that lands in private ownership shall pay construction charges of the dam, amortized at 5% interest over a period of 40 years.

The great reservoir soon to be created in the Canyon of the Gila will not only bring relief to the long-suffering Pima Indians but will bring into intensive cultivation thousands of acres of land in private ownership on a reasonable basis of cost. Under the dam will develop one of the most productive districts of the section, even equalling the Valley of the Nile in fertility.

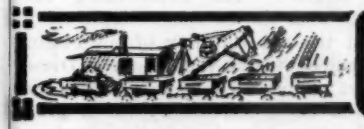
Know Your Truck Costs—I

(Continued from Page 263)

in the same way, but separately because they have a different figure of mileage life.

Interest on the investment (one of the fixed charges) is figured at one-half of the current rate of interest because the item of depreciation throughout the truck's serviceable life reduces the amount of the investment each year. Thus it is considered best practice to equalize this by considering only half of the interest charge.

With the above outline of desired information as the objective, we are now ready to see how this information can be obtained. In a subsequent issue of *The Excavating Engineer* we will discuss the forms and records which are necessary to supply the information for the above table.



· FIELD NOTES ·

Economizing in Space in Digging a Shallow Sewer

Contractors are frequently confronted with the problem of digging a sewer in a narrow street, where the conditions require that the spoil be deposited entirely on one side in order to leave the other side free for traffic or for the materials for the laying of the conduit or pipe. In such a case it is assumed that there is little surplus material after the back fill is made, the trench being approximately 10 feet wide by 3 or 4 feet deep.

A method of procedure which has several times been practiced with success is as follows:

When the trench is started, build a runway for the shovel from the excavated material about 2 feet high on either side of the trench, as shown in the sketch. This has a two-fold advantage; it economizes in space by taking care of a part of the excavated material and it serves as a dike which will permit the spoil to be dumped nearer the shovel, and higher than would otherwise have been possible.

In order to accomplish this successfully it should be remembered that the material must be firm, either stiff clay, hardpan, shale or blasted rock.

One Reason Why Gears Wear Out

Not long ago a steam shovel manufacturer received a complaint from a contractor who was working a shovel in heavy rock. The shipper shaft bearings apparently would not line up. They were re-babbitted again and again and trammed with the greatest care. One thrusting gear and pinion persisted in jumping. The boxes were condemned and returned to the manufacturer. An expert was immediately dispatched from the factory. He discovered that there had been some heavy blasting close to the shovel.

Instead of swinging the dipper to the shot, it was swung away, thus exposing the thrusting gear. The exposed gear was covered with fine stone at every shot, some of this stone had also lodged in between the teeth. Here it became encrusted. Consequently, this gear wore out much more rapidly than the one on the opposite end

of the shaft. This was the source of the whole trouble. The lesson is simple. It is far safer to make two or three small shots instead of one large one. When a large one is necessary, back up the shovel. When this is not necessary, take every precaution to protect the machinery. One precaution is, as shown, swing the dipper to the blast instead of away from it.

Some "Don'ts" for Rock Excavation

There seems to be a tendency among shovel men, when digging rock, to make the shovel "bite more than it can chew." In other words, to try to force as big a move as possible. This is a mistake for several reasons.

In order to make an extreme move it is necessary to dig with the handle run out practically to the end. In rock work the twisting stresses are great and although a shovel will stand up to it for a while, a breakdown is very probable, due to the strains caused by hard digging in this position. A shovel does not exert its maximum power with the dipper run out as far it will go. Furthermore, there is much more strength when the dipper is kept in as far as possible.

When an operator tries to stretch things and make a big move he often gets the front of the shovel so close to the face that in attempting to get the dipper back, he will frequently batter the front end of the car-body to pieces, pound the circle, and often cut the swinging cable.

Don't try to make too big a move in rock work.

Don't dig with the handle run out to its end.

Don't run the shovel up too close to the new face.

Short moves and more of them will get you farther ahead in the end.

DEVICES YOU OUGHT TO KNOW ABOUT

Bucyrus Company Announces Another Diesel Shovel and Dragline Excavator

A further addition to its line of Diesel shovels and dragline excavators has recently been announced by the Bucyrus Company. This machine, which is the largest of its three small revolving machines, is known as the 50-B. In dipper capacities and working ranges this machine is similar to its 50-B steam shovel and dragline. As a shovel it carries a 1¾-yard dipper, and may be

Bucyrus 50-B Diesel Shovel. This also may be equipped as a dragline excavator.

had with standard high-lift or extra high-lift booms, thus adapting it to a very broad range of digging conditions. As a dragline it may be had with a variety of boom and bucket combinations, ranging from a 45-foot boom with a 1½-yard bucket to a 60-foot boom with a ¾-yard bucket. As is the case with the steam machine, it may also be had with crane or clamshell bucket equipment.

The Bucyrus Company is the only manufacturer who has equipped its machines with a straight Diesel engine. The astonishing fuel economy, together with the extreme simplicity of this machine and the adaptability of the engine to excavation service, render the Bucyrus Diesel machines the most valuable contribution that has been made to excavating machinery for a great many years. The Diesel engine is the result of 20 years of engine builders' experience. The Atlas-Bucyrus engine, with which all three sizes of these machines are equipped, has been in operation on shovels and draglines in quarries and mines, on drainage and irrigation projects, highway construction and other excavation work in all parts of the world, and, furthermore, in every conceivable class of excavation. Its performance under these varying conditions has been uniformly remarkable, and has justified the statement that its application to excavating machinery is the most important forward step that has yet been made by manufacturers of such machinery.

The outstanding feature of the Diesel engine is that it not only burns a low-grade fuel oil that can be purchased at from 1/6 to 1/8 the cost of gasoline but that the fuel consumption has been found to be but a fraction of that of the gasoline machine. The Diesel shovel and dragline is, therefore, by all means the most economical excavator that has ever been produced. The engine itself is even simpler to operate and maintain than the gasoline engine, as there is no carburetor or ignition system to give trouble. There is no

explosion and consequently no sudden shock. Its power characteristics are very similar to that of the steam engine which for many years has been considered the ideal power unit for a steam shovel or a dragline excavator. The 50-B is powered with a mechanical injection, four-cycle, four-cylinder, slow-speed, heavy-duty 9 x 12 engine, running at a conservative speed of 300 R. P. M. This engine was developed particularly for excavating service and is especially rugged, has large bearings, extra heavy crank shaft and connecting rods, and extra heavy flywheel and rigid base. It is felt that this machine will supply a long-felt want for many types of excavation, especially in districts where coal is expensive and difficult to obtain and water is of a poor quality.

Hansen Automatic Dragline Bucket

The contractor is interested in any new device that will mean greater output at less expense. If he can heap more on his bucket by one method than by another, he will choose the former method for it may mean extra dollars in his pocket.

This is what the Hansen Automatic Dragline Bucket Company claims to do for the dragline owner with an automatic dragline bucket which

The Hansen Automatic Dragline Bucket

they have recently put on the market. Some of the features which they advertise in connection therewith are as follows: A heaped bucketful each time the bucket is lifted. To deliver that bucketful of dirt to the spoil bank without waste or loss. To handle a larger number of bucketfuls per hour. To handle these bucketfuls with a minimum of power and a minimum of strain on the cables and mechanism. That is the dream of the dragline owner and operator.

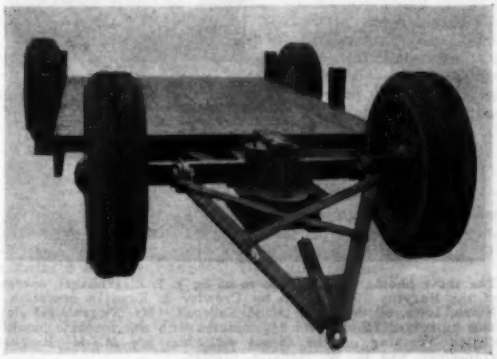
This device carries a full bucketful of even wet sand or soupy muck and delivers it to the spoil bank without messing up the berm. It can be lifted as soon as filled without danger of losing one-fourth to one-half of its load. It does its work with a shorter pull on the cable so that dirty cable does not get into the drums. It can be handled with a slacker cable and so with less strain on cable and operating machinery. It permits the operator to handle not only fuller buckets but more buckets per hour.

Tried out by a sand and gravel company in Iowa last summer, a 1¼-yard bucket loaded sand faster than the same machine had been loading it with a standard equipped 2½-yard bucket. Operating on the main canal in Drainage District No. 1, Hersey, Nebraska, the Austin dragline with 1¼-yard bucket has averaged 100 yards per hour and has dug as much as 1,400 cubic yards in one ten-hour shift. This machine equipped with Fairbanks-Morse Semi-Diesel engine has operated with the lowest fuel consumption, per 1,000 yards dug, of any machine known to the engine manufacturers.

Bucyrus Company Announces Trailer for Loading and Moving Small Revolving Shovels

Recognizing that there is a certain demand among contractors for trailers to be used for loading and moving small revolving shovels from one job to another, the Bucyrus Company of South Milwaukee, Wisconsin, is now prepared to offer their Transport Trailer, which it is believed will meet with a definite response from the contractor who owns a caterpillar shovel and who is obliged to move his machine frequently from place to place.

The Transport Trailer is recommended for hauling all classes of contractors' equipment weighing up to 30 tons. The loading clearance is 120 inches, and a small revolving shovel can be loaded and moved quickly by motor truck.



Bucyrus Transport Trailer

This trailer is built for heavy duty; the front axle is 4 x 4 inches high carbon steel, heat treated, and the rear axle is 6 x 4 inches and of the same material. The wheels are provided with Timken roller bearings and are of artillery type, and have oil-tight housings requiring lubrication only once a year. It is supplied with 12-inch front tires

and 14-inch rear tires. These are special heavy-duty cushion tires that effectually absorb road shocks and furnish ample cushioning action under varying loads.

The platform is constructed of 4-inch select grade, long-leaf, yellow pine, and its edges are protected all around by steel angle irons. The platform is supported by a framework composed of 8-inch steel I-beams, which is anchored to a heavy steel bridge casting at the front end and is reinforced at the rear end with a 10-inch, 30-pound steel cross channel. This construction provides a three-point suspension.

Further information may be obtained by writing to the Bucyrus Company, P. O. Box S, South Milwaukee, Wisconsin.

SHOTS FROM THE · FIRING LINE ·

Iowa and Missouri

BY W. A. PARROTTE

S. J. Groves & Sons were low bidders at Jefferson City, May 22, on 90,000 yards of road work.

Tibbetts & Tibbetts with J. W. Mathews in charge are making some high yardage runs with their Bucyrus 30-B Diesel shovel on road work near Lloyd, Missouri.

Stewart Construction Co. of Kansas City has the contract for basement on Medical Heights Building located at 21st and Baltimore. Mr. Stewart will finish this job in the next few days.

Pioneer Construction Co., International Life Building, Kansas City, have quite a bit of western road work under contract at St. Louis.

Geo. Pendergast, Merchants Laclede Building, was awarded contract for $150,000 worth of sewer work in North St. Louis.

J. T. Addis, St. Louis, has finished up the basement for Nugents Department Stores new addition.

The above photograph was sent to us by J. J. Ziegenhagel, operator of the Bucyrus 70-C owned by Crowley & Ryan in operation at Numa, Iowa, on the Rock Island Railroad. Mr. Ziegenhagel states that he moved 75 yards in 5½ minutes with this machine handling shale. Working on the shovel with him are M. M. Bingham, cranesman, and H. W. Hendrix, fireman.

The rainy weather of the last few weeks has been quite a drawback to Jos. Ballinger on his contract for the basement on the New Jewish Hospital in St. Louis. With the help of a few pumps Mr. Ballinger has kept going.

J. A. Schaeffer has his shovel working at University City.

A. V. Wills & Sons expect to get going again on their East St. Louis job in the next few days.

W. C. Hill has finished up his work for Henske Construction Co. Delmar & Wabash tracks, St. Louis, and is looking for a new place to land with his equipment.

New England News

BY E. B. WILLIAMS, BOSTON, MASSACHUSETTS

Maine

After a rainy spring delay, highway work in New England started up in earnest during the months of May and June with a number of contracts awarded in these months and considerable future work in view.

The Central Maine Power Company of Waterville, Maine, contemplates the construction of a concrete dam and power house near Lewiston, Maine, that will cost upwards of $4,000,000.

The city of Portland, Maine, will receive bids this summer for the construction of a water supply system with Lake Sebago as the source.

Massachusetts

The Massachusetts State Highway Commission awarded the following projects during the latter part of May: Towns of Essex and Ipswich to Cenedella Contracting Co. of Milford, Massachusetts, $104,396; Town of Southampton to D. J. O'Connell's Sons of Holyoke, Massachusetts, $132,510; Town of Lakeville to B. Perini & Sons of Ashland, Massachusetts, $312,361; Town of New Braintree to Charles E. Horn of Milbury, Massachusetts, $13,722; Town of Barnstable to Washburn & Sheridan of Monument Beach, Massachusetts, $16,253; Town of Salisbury to James E. Watkins of Amesbury, Massachusetts, $57,674.

Due to the high estimates submitted for preliminary figures on the proposed new Statler Hotel in Boston, this project has been indefinitely postponed.

In spite of the fact that several large projects have been put on the calendar for future reference around Boston proper, the apartment building boom still exists, and a few shovels manage to earn their daily living by paving the way for some more cliff dwellers.

As usual J. C. Coleman & Sons keep on the job and their four shovels are all doing their bit. Ira Earles is running a 20-B for the above company on a job at Marsh Street and Cunningham is keeping up the pressure. Ned Butterfield is running an Erie for Coleman in Charlestown, Massachusetts, on the new Mystic Playground. Rumor has it that Ned is going to start in business for himself despite the coaching of several brothers. We wish him the best of luck.

Charles Sullivan is operating an Erie for Jeremiah Sullivan's Sons of Cambridge on a job at Watertown, Massachusetts, and George Kempford is making things interesting for Charlie on the same job with a Marion.

Den Keefe is running an Erie for Cronin & Driscoll.

Bratley & Cahill of Everett are using their Bucyrus 14-B caterpillar on a highway job near Lowell, Massachusetts, having sublet the excavation from Thomas Jewett of New Bedford, who has the general contract.

Vermont

Vermont started the New England Highway season by doing one job themselves and awarding several good-sized contracts.

D. W. Overocker of Brattleboro, Vermont, was awarded the contract for improving the Barton-West Burke Road at a bid of $33,358, and was also awarded the contract for grading state highway in Guilford County at a bid of $106,303.

Earle & Merry of Rutland, Vermont, received contract for project in Chester County at a bid of $60,585.

The Water and Light Commissioners of Morrisville, Vermont, were awarded the contract for a concrete dam and power house on the Winooski River to J. M. Swan & Son of St. Johnsbury, Vermont, at a bid of $150,000.

New Hampshire

The New Hampshire State Highway Commission received the following bids the first part of June for work in various counties: Town of Orange, low bid by Amos D. Bridges of Hazardville, Connecticut, $27,948; Town of Randolph, low bid by William H. Hinman, Medway, Massachusetts, $14,830; Town of Danbury, low bid by A. D. Bridges of Hazardville, Connecticut, $15,858; Town of Gorham, low bid by William H. Hinman of Medway, Massachusetts, $18,008; Town of Whitefield, low bid by Thomas E. Meloy of Gorham, New Hampshire, $33,923; Town of Windham, low bid by Peckham Road Corporation, Pomfret Center, Connecticut, $16,119; Town of Lisbon, low bid by J. E. Normandeau of Concord, New Hampshire, $22,452; Town of Thornton, low bid by J. E. Normandeau of Concord, New Hampshire, $12,515; Town of Littleton, low bid by O. W. Fernald of Berlin, New Hampshire, $14,317; Town of Plymouth, low bid by Lane Construction Corporation of Meriden, Connecticut, $12,074.

The Water Supply Board of Providence, Rhode Island, awarded the contract for 60,000 yards of grading on the Scituate Road to J. H. Sullivan of Brighton, Massachusetts. This road was made necessary by the fact that four miles of the old Scituate Road will be flooded when the dam now under construction at Hope, Rhode Island, is completed.

Bids were opened at Providence the last of May by the Water Supply Board for additional work on the new dam at Hope, involving approximately 4,000,000 cubic yards of excavation. The bidders and their totals are as follows: Winston & Co., Kingston, New York, $1,799,210; Wilson & English Construction Co., New York City, $2,114,200; Whiting Turner Co., Baltimore, Maryland, $2,146,740; Simpson Bros. Co., Boston, Massachusetts, $2,164,825; Philipsburg Construction Co., Yonkers, New York, $2,176,800. Winston & Company were awarded the contract for the work.

The Northern New York Utilities Corporation awarded contract to H. R. Beebe of Utica, New York, for the construction of a 10,000 horse power steam generating plant at Rome, New York.

The St. Lawrence Valley Power Corporation of Potsdam, New York, awarded the contract for the construction of a concrete and brick power house, saddles for a 4,550-foot steel penstock, tailrace excavation, and a gravity type concrete dam on the Racquette River to the Morton C. Tuttle Co. of Boston, Massachusetts.

Mr. W. H. Ryerson formerly of the Aberthaw Company has complete charge of the work for the Tuttle Company and Mr. F. L. Baker is the engineer in charge. Harry Guion is operating a Class-14 Bucyrus dragline taking out the tailrace from the present bed of the Racquette River.

The Northern New York Utilities Corporation of Watertown, New York, awarded the contract for a hydro-electric development on the Beaver River at Soft Maple Dam, including concrete core dam, penstock and power house to the United Gas Improvement Company of Philadelphia, Pennsylvania. Mr. Charles Locker will be in charge of this project.

The Beaver River Power Corporation plans the construction of a dam and power house at High Falls, New York.

Charles F. French is operating an Erie shovel taking out the foundation excavation for this power house.

The American Pipe and Construction Co. of Amsterdam, New York, were awarded contract by the New York State Barge Canal Board for excavating and placing rip-rap bank protection along various sections of the Erie Canal.

New York State has been very active this year in highway building, and their program includes a letting at Albany at least every two weeks; as a consequence there has been a large gathering of old and new faces among the contractors in attendance.

The following projects were awarded at the letting held early in the month: White Creek-North Hoosick Road to F. D. Miller Co., Norwich, Connecticut; Batavia-Bergen Highway to Constantine Construction Co., Buffalo, New York; Waverly-Owega Road to Wieberg Bros. of Corning, New York; Wells-Speculator Road to J. J. Bellote & Son of Troy, New York; Old Forge-Eagle Bay Highway to Foley & Van Auken of Thendara, New York; Carthage-Rensselaer Road to Fitzgerald Brothers Construction Co., of Troy, New York; Tone Arabia-Epgrataph Highway to S. B. Van Wagenen of Roundout, New York; Ninevah-Afton Road to F. Lewis Sons, Afton, New York.

New York and Vicinity

BY T. A. BURNS

John F. Nolan Contracting Company of New York and Summit, New Jersey, have been awarded the Lackawanna Railroad work at Anamolick, Pennsylvania. This entails a large yardage of rock and earth.

Arthur McMullen, railroad contractor, 50 Church Street, New York City, has been awarded the Jamestown Yard work on the Erie Railroad, and must handle 160,000 yards of earth in connection with this work.

The Jersey Central work at Somerville, New Jersey, has been awarded in part to Richard & Gaston of Somerville. The well-known firm of Wilson & English have been awarded the remainder.

The $3,000,000 Bronx Public Market has at last been permitted to go forward and the Niewenhouse Company, Inc., of Manhattan, are the lucky bidders.

Some local bidder is going to get a 400,000-yard rock job at Ravens Run, Pennsylvania, within the next few days.

Conditions as a whole are improving in and throughout the New York Metropolitan territory at present.

A large number of fair-sized railroad jobs are being let and the building boom appears to be taking on new life. These favorable conditions seem to be due to a slight reduction in prices of materials and cost of labor.

Northwestern States Notes

BY A. R. HANCE, PORTLAND, OREGON

Contractors are now working on the Belton-Java Road, which will form the connecting link across Glacier Park, where cars now must be shipped. Thirty-five men are busy, aided by a steam shovel and an excavator, and another steam shovel is to be put to work there within a few days, as the project is to be rushed as fast as possible. The State Highway Commission of Montana also has let a contract for the Divide Creek Hill on the east side of the Glacier Park, to eliminate the worst grade into St. Mary's Lake into Cardston, Canada, connecting Glacier Park directly with Canada.

The Utah Construction Company has been awarded the contract for the grading in connection with the construction of the Rogerson-Wells line, which runs in a southerly direction from Rogerson, Idaho, and connects with the Southern Pacific at Wells, Nevada. The cost of the grading was not made known, but the estimate for the construction of the line was placed at $5,094,000. It is hoped to have the line completed to Wells, Nevada, by June 30, 1925, the date scheduled for completion in the railroad company certificate of convenience and necessity. The engineering force is already on the ground at Rogerson and within two weeks rail-laying gangs will be transferred to that place. The railroad from Rogerson to Wells will consist of one track, laid with 90-pound steel. The heavy steel will allow for as heavy traffic as on the main trunk line of the Oregon Short Line.

Contract for the construction of the Divide Creek Hill Federal Aid Highway has been let to Walter J. Hill, son of the late James J. Hill, builder of the Great Northern Railway. His bid was $97,251.05. The bids were opened recently by the Montana State Highway Commission. Mr. Hill's offer was $20,000 lower than the state engineer's estimate. The road is located in the western part of Glacier County and is 6.10 miles long through timber. The specifications call for grading, gravel surfacing and draining.

Long expected action on the agricultural bill, which appropriates $75,000,000 for federal aid on road construction throughout the country, has been taken by the Senate, and on July 1 the funds will become available. Washington's share of this sum is approximately $1,200,000. The Forest Road Bill for highway construction and improvement in the national forests will give the Forestry Service $6,500,000 to spend, during 1924-1925. This measure has not yet passed, but has been agreed upon. Of the total sum, it is estimated $639,970 will be expended on national forest roads in Washington. The amount available for road and bridge construction in Mount Rainier National Park will not be less than $140,000 and will be spent in improving the Nisqually Road and in constructing a thoroughfare from the White River entrance to Yakima Park. Members of the Washington delegation have been advised from Olympia that several important state highway projects have been awaiting the passage of the Agricultural Department appropriation bill.

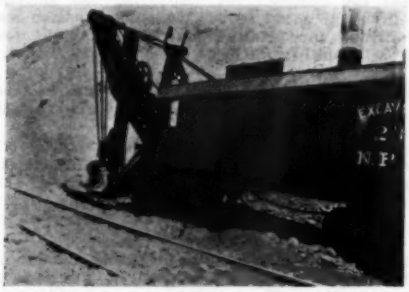
Henry & McFee, Northern Life Building, Seattle, Washington, were awarded a contract for five miles of grading near Oakridge by the Southern Pacific Railway.

Roads and trails in the Beartooth National Forest of Montana are to be improved to the extent of approximately $30,000 during the coming summer, which is a total of about 18 miles of road construction. The program calls for the construction of approximately 27 miles of trail.

Pacific Coast News

BY P. H. BIRCKHEAD AND JACK SACKETT, SAN FRANCISCO, CAL.

William Kubyson, 3522 Princeton Street, Spokane, Washington, has sent us this view showing old Bucyrus shovel No. 443 owned by The Northern Pacific Railway in operation at their Algoma Pit in Northern Idaho. The



shovel has seen 23 years of active service, and as Mr. Kubyson says, "It is still going strong." Mr. Kubyson is operating, while Charles Bobo is craning and George Garrison is firing the shovel.

The Riverside Portland Cement Company's new 50-B is working out very much to their satisfaction. Ed. Rice is operator and Harry Horsman, fireman.

Plans have been made by the Southern Pacific Company for the following work near Yuma, Arizona: Laying track along the Gila River Levee Improvements to the Gila River Levee; additional track facilities; construction of a large bridge across the Gila River. Total cost of improvements in excess of $1,000,000.

Contract has been awarded to the Utah Construction Co., Phelan Building, San Francisco, by the Northern Pacific and Oregon Short Line Railroads, for the construction of the Rogerson, Idaho, to Wells, Nevada, Cut-off, a total length, including sidings, of over 100 miles. The roadbed will be constructed through rolling country, involving fairly heavy grading. Two or three large steel bridges will be constructed. Estimated cost $3,600,000. Work will probably be started within two or three weeks.

Contract awarded to John Phillips, Oakland, for the completion of a contract in Drainage District No. 100 and No. 200 and Butte Creek District, Butte County, for the Union Indemnity Co., San Francisco. Work will involve 40,000 cubic yards earth excavation and completion of a reinforced concrete weir and other structures.

Contractor John Phillips was a recent caller at the office and reports satisfactory progress on his work in Reclamation District No. 108, which is nearly completed. He has just secured a good-sized job of ditch work near Westley and is moving his Bucyrus 20-B and a Stockton dragline to the work.

S. L. Lovejoy, who has been operating the 50-B shovel for Callahan & Cooney, Los Angeles, has returned to his home at Manitou, Colorado.

Southern States News

BY C. N. BALLENTINE AND W. W. WHORLEY

W. H. Parker, who has been operating a shovel at Charlotte, North Carolina, dropped in to see us recently. Anyone anxious to get in touch with a good shovel runner can reach him through this office.

Fred Blankenship, who has been running a 20-B dragline for the Monroe Sand and Gravel Company, at Monroe, Louisiana, arrived in Birmingham recently. Fred is originally from this district, and is anxious to locate with some good, live firm.

The Saragossa and Manchester Mining Companies are operating their strip mines, near Jasper, Alabama, on a double shift basis. The following is a list of the crews:

Walter Self and Fred Farley are running a 175-B at Saragossa, assisted by Ches. Guyton and General Harris as cranesmen. Columbus Tedford is loading coal with an 18-B. Mr. Vay Daniels is superintendent in charge.

Ralph Cooper and George Shaw are handling levers on the 175-B at Manchester. Oscar Hudson and Steve Harris are craning for them. A 30-B is being used to load coal, under the guidance of Otis Burns, assisted by Will Hudson. Mr. A. C. Elliott is superintendent in charge.

T. M. Weed is loading gravel near Springville, Alabama, for J. M. Jones, of Birmingham.

We were pleased to have Mr. L. A. Guillaume, an old-time shovel man, drop in to see us recently. Mr. Guillaume has been working near Mulberry, Florida, and can be reached at that point.

There has been some delay in starting operation on the Central of Georgia grade revision work, on account of lack of right-of-way. Many contractors are getting their outfits in, and by the time this is printed will likely have made some nice estimates.

Cook & Karner are installing a new 30-B on their work near Waverley, Alabama.

J. H. Bull, of Winfield, Alabama, has recently contracted to load gravel for Stanley & Singer on their highway contract near Haleyville, Alabama. Mr. Bull has placed a 20-B on this work, and it is a safe bet that he will handle this job on time with his characteristic energy.

Tennessee contractors are turning their interest to the large amount of highway work which will be let at Nashville, Tennessee, on June 20th. At that time bids will be received on a dozen new projects, and it is expected that contractors from other States will also submit their bids.

We were pleased to have Mr. S. P. Darrow visit us recently. Mr. Darrow is an old-timer in the coal-mining game and has recently been engaged in lignite stripping in Texas.

Bids were opened June 10th at Bishopville, South Carolina, on 400,000 yards of drainage work, the lowest bid being submitted by the Walb Construction Co., of La Grange, Indiana.

Mr. W. O. Austin is handling a 20-B Bullseye for the Columbia Clay Co., at Columbia, South Carolina. Mr. H. Hunter Smith, Vice-President, is in general charge of the entire plant.

St. Louis Items

BY A. B. KOENIG

The Industrial Track Construction Co., St. Louis, of which H. E. Billman is President, sprung a surprise on some of the old heads in this neighborhood by branching into the steam shovel game. Their first winner was 220,000 yards of work for the Mobile & Ohio Railroad at Jackson, Tennessee. They are cutting down a hill and grading yards and site for the new machine shop there. John Cox, an old-timer around steam shovels, will be in charge of their job, which is assurance that their first shovel job will be completed satisfactorily and ahead of contract time.

Young & Hall started on their road contract between Witt and Nokomis, Illinois.

W. A. Ross Construction Co. were awarded contract for repairing with bituminous macadam 5½ miles of county road between Lees Summit, Missouri, and Longview Farm.

J. P. Sparks, Kirkwood, Missouri, has 25,000 yards of state highway work in St. Charles County, Missouri, to let. Also has another small job in the southwest part of the state to sublet.

Pete Shugart and Blythe Bros. started on the Illinois Central double-track work between Belleville and Pinckneyville, Illinois. In addition to their own outfits they have Chas. Maroney, Jim Anderson and Pat McGraw's team outfits on the line.

The Halpin-Boyle Construction Co. received contract for reconstructing Independence Road between the eastern Kansas City limits and Fairmount, a distance of 1⅞ miles, 9-foot reinforced concrete pavement on each side of the present roadway. This firm were also awarded contract for reconstructing Grandview Road between Grandview and Red Bridge, 2½ miles with bituminous macadam.

The Cast Stone Construction Co. of Eau Claire, Wisconsin, were awarded contract for the paving of Sections 20 and 21, Route 8, in Iroquois County, Illinois, a distance of 12 miles extending from Gilman to Watseka. Their bid was $243,388.

The contract for paving of Sections 1 and 2, Route 16, in Edgar County, Illinois, extending from Paris to Kansas, a distance of 13 miles, was awarded to Charles W. Clark Construction Co. of Terre Haute, Indiana, for $244,000.

T. F. Elton, representing Booth & Flinn, Limited, Pittsburgh, was here to look over a couple of sewer jobs being let by the city.

All bids for the new 200-foot stack at the city water works, Springfield, Illinois, were rejected May 29th, by the City Commission, which ordered a call for new bids on the improvement. Bids received were unsatisfactory, Commissioner Willis J. Spaulding states.

The V. E. Schevenell Construction Company, 509 Empire Building, Memphis, Tennessee, has been awarded the contract for the paving of a 17½-mile section of the Birmingham-Montgomery Highway in the northern half of Chilton County, Alabama, the contract approximating $542,000.

John Simmons, LaPlata, Missouri, has 50,000 yards of State Highway work in Sullivan and Putnam Counties, Missouri, to sublet.

P. J. Hannan Construction Co., St. Louis, are low bidders on grade separation, bridge and concrete work on the Wabash Railroad near Detroit, Michigan.

P. J. Murphy has sublet a bridge filling job on the Wabash Railroad at Carrollton, Missouri, to A. J. Saunders. Murphy has one of his own team outfits at work at Clifton, Missouri, on a road job.

The Mitchell Construction Co. was awarded contract for the construction of a stretch of hard road on Route No. 13 in Williamson County, Illinois. The contract price was $53,201.86.

The contract for the paving of Jefferson Street between Amos Avenue and West Grand Boulevard, Springfield, Illinois, was awarded to the Alzina Construction Co. which bid paving, $2.86 a square yard; curb gutter, $1.15 a foot; cast iron water inlets, $17 each; 12-inch crock pipe $1.20. This pavement is to connect Jefferson Street with the Beardstown hard road.

The McMahan Construction Co. of Rochester, Indiana, was awarded contract for the paving of Section 55, Route 2, in DeWitt and McLean Counties, Illinois. Their bid was $188,687.

The contract for grading and constructing branch railroad to the new water works plant here was awarded to the Industrial Track Construction Co. of St. Louis.

The Frazier-Davis Construction Co., St. Louis, were awarded contract for the intake and the engine pits at the new St. Louis water works plant on the Missouri River. Their bid was $1,058,228.

Rowan & Rickard of Oklahoma City, Oklahoma, were awarded contract for construction of 12 miles of sewers between the city limits of Pine Bluff, Arkansas, and the country club. Work will begin immediately.

J. E. Bretz finished paving Second Street from Capitol Avenue to Monroe Street, Springfield, Illinois.

The City Council of Poplar Bluff, Missouri, plans to call an election to vote on a bond issue of $150,000 for the construction of a modern filtering plant and new settling basin for the city water department. The plant now in use was constructed 20 years ago.

The Dennison Construction Co., Cushman, Arkansas, were awarded contract for concrete and steel bridges on the Batesville-Mamoth Springs, Arkansas, Highway. In addition to this work they have a 20-team outfit at work on State Highway in Dunklin County, Missouri; 50 teams on highway near Fulton, Arkansas; also a 35-team outfit on levee work near Council, Arkansas. Walter Dennison reports a 35-team outfit, caterpillar grader and wagons idle at Phillipy, Tennessee, that he desires to place on work immediately. Write them Cushman, Arkansas, or wire Batesville, Arkansas.

Cook & Stucker Company of Ottawa, Kansas, were awarded contract for the construction of the first three miles of the Kansas City-Olathe Highway on a bid of $101,350.45. The contract calls for the paving of the road from a point half way between Merriam and Shawnee, Kansas. The road will be paved with brick. Contracts for the remaining 10 miles of the highway will be awarded as soon as plans for the road have been approved by the State and Federal Highway Commissioners.

Contractors when in want of work or labor for their outfits write or wire Koenig Labor Agency, 612 Walnut Street, St. Louis, Missouri, or 501 Delaware Street, Kansas City, Missouri.

W. F. Smith was low bidder on three jobs on the St. Louis-Festus, Missouri, Highway and was awarded contract at $275,000.

Hall & Davis were awarded contract for about 5 miles of the St. Louis-Kansas City Highway in Warren County, Missouri.

Mike Hasse was awarded contract for about 2 miles of the Parkville-Kansas City Highway in Clay County, Missouri.

B. H. Piepmeyer, Chief Engineer of the Missouri State Highway Commission, Jefferson City, Missouri, will open bids on June 24th for the construction of a number of highways and bridges. Reading of bids will be broadcasted from Radio Station WOS at 10:10 a. m., June 24, 1924. (Wave length 441 meters.)

Z. C. Mitchell of the Smith & Mitchell Contracting Co., Kansas City, was here a couple of days posting up on conditions in this neighborhood.

The Union Bridge Company was awarded contract for constructing bridge across Arkansas River by the Santa Fe Railroad.

Canada

Vancouver and Vicinity

BY J. C. MOON

Two paving contracts have been let by the City of Vancouver in connection with the approaches to the Canadian National and Great Northern Depots, on Main Street; one amounting to about $28,000 for one-course concrete paving was awarded to Mr. C. D. Collard and the other to the Columbia Bithulitic Company for "Warrentite" Bithulitic surfacing on a six-inch black base at a cost of about $31,000.

By-laws for a large amount of city work were ratified by the ratepayers of Vancouver last week, which means a considerable expenditure on road and sewerage work in addition to protective work on the water system.

The Pacific Construction Co., Vancouver, will finish the excavation for the new "Spillers" Elevator at an early date and have already started concrete.

The Carter Halls Aldenger Co., Vancouver, have opened a branch office here in charge of Mr. Weston and associated with them is Mr. D. C. Collard, paving contractor.

The Northern Construction Co. are making progress on the Second Narrows Bridge, Vancouver Harbour; the cost will be about $1,500,000, and the gravel fill for the railway approach on the north end is already constructed, together with a good deal of the piling work, and several concrete piers are already in place. The steel spans will be placed in position during the summer.

Winnipeg and Vicinity

BY F. X. AMOSS

The city of Winnipeg is about to start the use of a central steam-heating system. A considerable portion of the downtown section is embraced in the first venture, and the contract for the construction of the ducts and piping has been let to the Nelson River Construction Company of Winnipeg at a price of $181,899. The work will be completed in about three months.

The Province of Saskatchewan is doing considerable provincial highway work this summer. Two contracts for the construction of a provincial highway have already been let, one for approximately fourteen miles and the other for seven miles. A very strong endeavor is being made in Manitoba to have a provincial highway to connect with Kenora, Ontario, under way as soon as possible, so that a good motor road may be had to this well-known summer resort.

Mr. J. McKay is building a new school at Russell, Manitoba.

Mr. H. P. Keith, formerly District Engineer of Highways for the Provincial Government at Lethbridge, Alberta, has been appointed Commissioner of Highways.

A number of western citizens are planning to attend the "Good Roads" Convention to be held at St. Andrews-by-the-Sea, New Brunswick, from June 24th to June 27th.

The management for the Canadian Pacific Railway have authorized the construction of five hundred miles of branch lines in the Western provinces, and some contracts have already been let. The Canadian National program for branch lines is expected to be approved by Parliament shortly, and this will make more activity in railway construction work than the West has enjoyed for some time, besides giving settlers much needed transportation facilities.

Mr. W. S. Tomlinson has secured the contract for the construction of a reservoir for the Canadian National Railways at Edson, Alberta.

Mr. Jordan, a well-known Western contractor, is making an extended visit to Winnipeg.

Mr. W. J. Whillans, Superintendent of Work Equipment, Canadian National Railways, has returned from an official trip to Montreal.

Montreal and Vicinity

BY J. M. WARD

Hydro-electric development in Quebec Province appears to be very much in favor these days. There are a number of projects under way at the present time, and some further ones are talked of.

Plans are being prepared for a $10,000,000 development at Paugan Falls, on the Gatineau River, for the Hull Electric Company.

Another development is proposed for the Township of Simpson, consisting of a concrete dam and power house for the Southern Canada Power Company. The concrete dam is to be 1000 feet long, and there are two earth fill dams, one 2200 feet long and the other 2000 feet long with a 25 x 106 power house, steel frame, concrete and brick, with six turbine generator units.

Another dam which is contemplated for the Canada Paper Company at Ulverton has been postponed for a little while.

The Algonquin Power Company's development at St. Paulin, Quebec, has not yet been awarded, but it is hoped that something definite will be done in connection with this inside of the next couple of weeks.

We have a letter this week from Jim Cavicchi of the Bedford Construction Company. They are at present operating in Jamaica but hope to finish up there by the end of June when they are returning to Canada.

Pat Horgan and Sam Telfer of St. John have associated themselves with Bill Cook of North Sydney, and have taken on about twenty odd miles of gravel highways in the Province of Nova Scotia.

The City of Three Rivers, Quebec, has passed by-laws to spend about $500,000 on improvements to aqueduct and new filtration plant.

The City of Shawinigan Falls are spending considerable money this year on grading new streets.

The City of Fairville, New Brunswick, contemplates spending $150,000 on pavements.

TRADE NOTES

Oliver Iron Mining Company Announces New Purchasing Agent

Announcements were made, effective June 1st, that R. G. Mace is appointed Purchasing Agent, and R. W. Marshall, Assistant Purchasing Agent, of the Oliver Iron Mining Company. Both have been employed in that department for a number of years.

R. G. Mace is the nephew of the late R. E. Mace, who for so many years held the position of purchasing agent and since the latter's death has met the responsibilities of the work most successfully.

The Chicago Pneumatic Tool Company, New York, announce the removal of their Los Angeles Branch, Sales and Service Headquarters, 307 East Third Street, to their new building, 655 Santa Fe Avenue, which has been made necessary by the rapidly expanding business handled from the Los Angeles Branch, which serves Southern California, Southeastern Nevada, Arizona, lower California and Sonora, Mexico.

A survey just made of the larger contracting operations in the United States shows that projects are now under way which will require a total of 8,640,000 pounds of explosives. In the survey are included the principal tunnels being constructed in various parts of the country, harbor development at various points, the principal hydro-electric projects and the larger drainage and railroad building jobs.

Mr. L. D. Albin, formerly General Sales Manager of the Ingersoll-Rand Company, 11 Broadway, New York City, has been elected vice-president in charge of European sales of that company.

Mr. D. C. Keefe, formerly Assistant General Sales Manager, has been appointed to succeed Mr. Albin as General Sales Manager.

The rapid increase in the use of motor trucks in the general transportation industry is strikingly apparent in an analysis of sales just made by officials of the General Motors Truck Company. Since the first of the year the transportation field has ranked first in the number of trucks purchased. The survey showed that staple industries largely predominated in the list of large truck buyers.

The growing use of motor trucks for interstate and intercity freight hauling is credited for a large part of this increased use of trucks for transportation purposes. It is expected that during the next few years the demand for trucks for freight hauling will continue heavy, to meet the requirements of the larger railroads that are substituting the motor truck for the handling of package and short haul freight.

Another interesting fact brought out by the sales analysis is the growing use of tractor trucks, particularly for transportation purposes. The trend in this field is toward economy of operation by using a tractor truck and trailers, according to the sales records of the General Motors Company.

Other industries that have provided active truck markets so far this year and which occupy high places on the GMC sales record are oil, lumber, baking, public

utilities, general food products, building construction, furniture and warehousing.

Sales so far this year indicate 1924 will be a record-breaking year for GMC trucks, company officials report.

Mr. H. A. Sparrow has joined the Robert June Engineering Management and Industrial Advertising Organization of 8835 Linwood Avenue, Detroit, Michigan.

Mr. Sparrow is a graduate of Rensselaer Polytechnic Institute with the degree of M. E.

He has served in the capacity of Assistant Sales and Advertising Manager of the London Steam Turbine Company of Troy, New York, and later as Plant Engineer with the New York Telephone Company of Brooklyn.

REVIEW OF BOOKS and CATALOGS

We shall be glad to review, in this column, such books and catalogs as are sent to us.

THE ECONOMY OF BETTER LUBRICATION—This recent publication of the McCord Radiator & Manufacturing Company, containing illustrations of their Class-B Lubricator adapted to small steam engines, oil engines, gasoline engines, air compressors, steam pumps and auxiliaries, points out the phases of economy that can be obtained from proper and efficient lubrication. The outstanding features of economy due to this type of machine, its importance and necessity, are all clearly enumerated and described. The booklet contains a complete set of overall dimensions, price lists and description of this lubricator. Copies are obtainable by addressing the *McCord Radiator & Manufacturing Company, Lubricator Division, 2587 East Grand Boulevard, Detroit, Michigan.*

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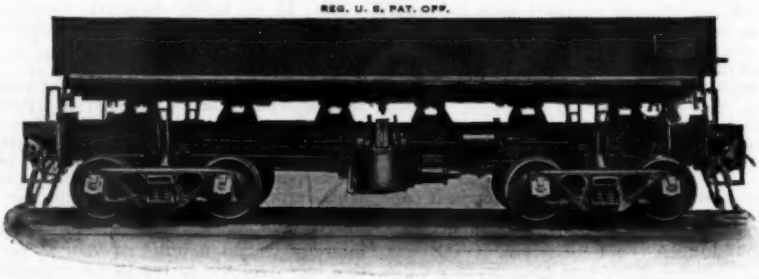

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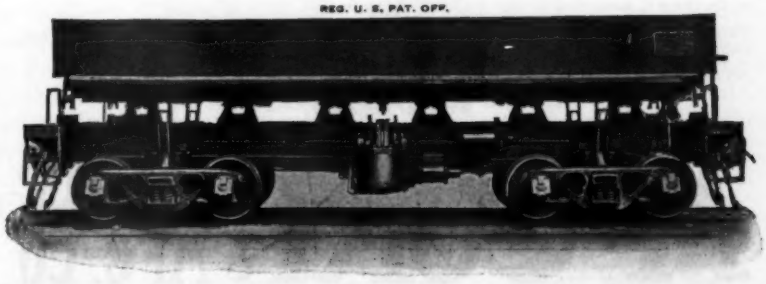

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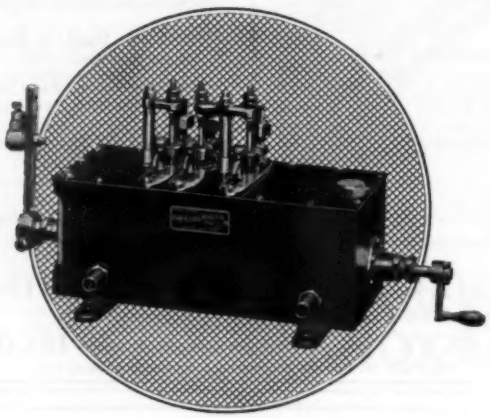

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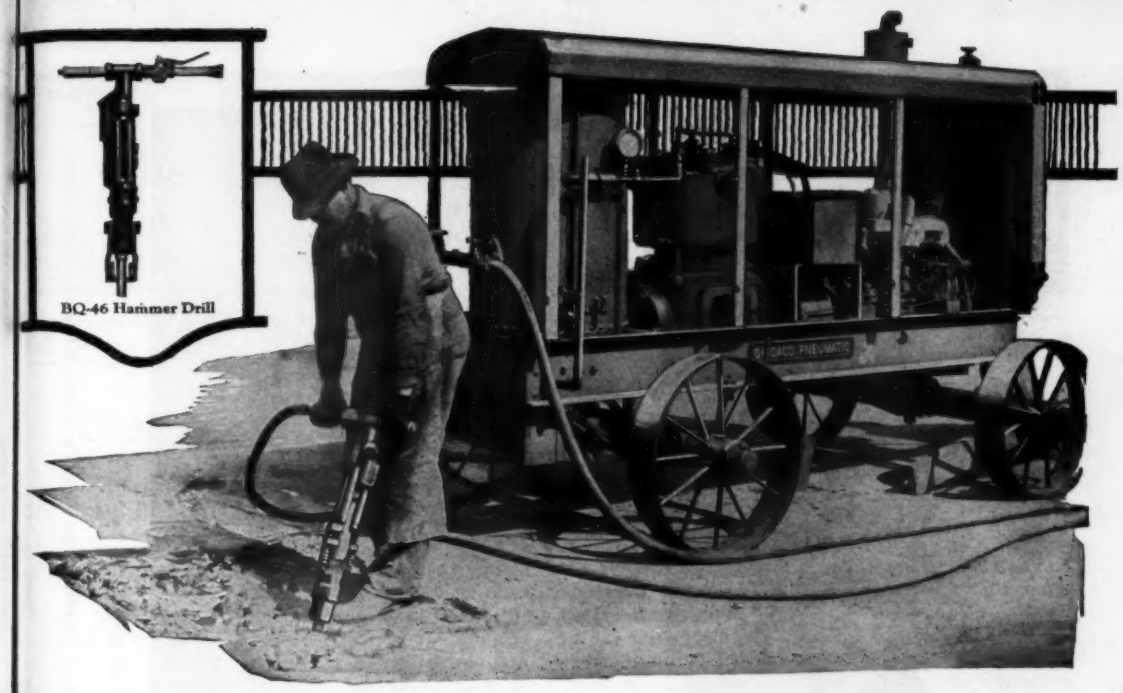

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View of the Upper Channel Change, Chesapeake & Ohio Railroad, Clifton Forge, Virginia

Another View Showing the Lower Channel Change and Classification Yard

Views of Brooks-Callaway's Large Contract with the Chesapeake & Ohio Railroad at Clifton Forge, Virginia, which is Nearing Completion.